CLAIMS

1. A biometrical identification system for identifying an individual finger (1), said finger comprising an inside surface (2), said device comprising:

    -   acquisition means (4) for acquiring an intra skin image (ISI), said intra skin image being located inside the finger at a distance (D) from the inside surface (2) of the finger, said intra skin image comprising sweat pores (P_1, P_2, P_3),

    -   location means (5) for locating said sweat pores as isolated spots in said intra-skin image (ISI),

    -   matching means (6) for matching said pore locations (CP_1-CP_N) with reference pore locations (RP_1-RP_M) of a reference intra skin image (RI) to produce a pore correlation score (PCS),

    -   decision means (7) for deciding of a successful or failed pore-based identification (PI) from a comparison of the pore matching score (PMS) with a predetermined pore threshold.

2. A biometrical identification device as claimed in claim 1, wherein said intra-skin image comprises fingerprint ridges and said device further comprises:

    -   macrofeature location means (30) for locating macro-features located on said fingerprint ridges,

    -   macrofeature matching means (31) for matching said macro-feature locations (MF_1-MF_L) with reference macrofeature locations (MF'_1-MF'_K) to produce a macro-feature matching score (MFMS),

    -   macrofeature decision means (32) for deciding successful or failed macrofeature-based identification (MFD) from a comparison of the macrofeature matching score (MFMS) with a predetermined macrofeature threshold.

3. A biometrical identification device as claimed in claim 2, wherein the pore location means are intended to locate the sweat pores with respect to the macrofeatures.

4. A biometrical identification device as claimed in claim 1, wherein the acquisition means (4) comprise:

    -   a radiation source (41) for generating a radiation beam (42),

- focusing means (43) for focusing said radiation beam (42) at the distance (D) from the inside surface (2) of the finger (1),

- detecting means (44) for detecting a reflected radiation beam (45) reflected by the finger (1).

5. A biometrical identification device as claimed in claim 4, wherein the focusing distance from the inside surface of the finger is greater than 0.1 and less than 0.5 mm.

6. A biometrical identification device as claimed in claim 4, wherein said acquisition means comprise a confocal microscope.

7. A biometrical identification device as claimed in claim 1, wherein first pore locations corresponding to a first intra-skin focused image are used as an initialization for locating pores of a second intra-skin focused image.

8. A biometrical identification system as claimed in claim 2, comprising:

- second acquisition means (50) for acquiring a superficial image of the inside surface (2) of the finger (1),

- second macrofeature location means (51) for locating macrofeatures located on said fingerprint ridges,

- second macrofeature matching means (54) for matching said second macro-feature locations (MF'$_1$-MF'$_L$) with superficial reference macrofeature locations (RMF'$_1$-RMF'$_K$) to produce a superficial macrofeature matching score (SMFMS),

- second macrofeature decision means (55) for deciding of a successful or failed superficial macrofeature-based identification (SMFD) from a comparison of the superficial macrofeature matching score (SMFMS) with a second predetermined macrofeature threshold,

- second pore location means (51) for locating said sweat pores as isolated spots in said superficial image (SI),

- second pore matching means (52) for matching said second pore locations (CP'$_1$-CP'$_N$) with superficial reference pore locations (RP'$_1$-RP'$_M$) of a reference superficial image (RSI) to produce a superficial pore matching score (SPMS),

- second pore decision means (56) for deciding of a successful or failed superficial pore-based identification (SPFD) from a comparison of the superficial pore matching score (SPMS) with a second predetermined pore threshold,
- global decision means (57) for deciding of a successful or failed finger identification (ID) using the macrofeature-based identification (MFD), the pore-based identification (PD), the superficial macrofeature-based identification (SMFD) and the superficial pore-based identification (SPD).

9. A device for producing an intra-skin image (ISI) of an individual finger (1), said intra-skin image comprising sweat pores for use in biometrical identification of said individual finger, said device comprising:
- placement means for placing an inside surface (2) of the individual finger (1) in front of acquisition means,
- said acquisition means for acquiring said intra-skin image, said intra-skin image being located inside the finger at a distance (D) from the inside surface (2) of the finger,
- storage means for storing the intra-skin image (ISI) into a memory.

10. A device as claimed in claim 9, comprising a confocal microscope.

11. A method of identifying an individual finger (1) comprising the steps of:
- acquiring (4) at least an intra-skin image (ISI) of the individual finger, said intra-skin image being located at a distance (D) inside the finger and comprising pores,
- locating (5) said pores as isolated spots in said intra-skin focused image,
- matching (6) said pore locations with reference pore locations of a reference intra-skin focused image to produce a correlation score,
- deciding (7) of a successful or failed pore-based identification (PI) from a comparison of the pore matching score (PMS) with a predetermined pore threshold.